OCTOBER 22, 2015

RESOURCES FOR YOUR COMMUNITY

GUINN WALLOVER

WATER RESOURCES AGENT
CLEMSON UNIVERSITY COOPERATIVE EXTENSION SERVICE

CLEMSON COOPERATIVE EXTENSION

CENTER for WATERSHED EXCELLENCE
CLEMSON UNIVERSITY INSTITUTE OF COMPUTATIONAL ECOLOGY

Carolina CLEAR
A Service of Clemson Extension

Partners in Education & Compliance

Carolina Clear is a comprehensive approach developed by Clemson University to inform and educate communities about water quality, water quantity and the cumulative effects of stormwater while delivering compliance-appropriate outreach for community stormwater permits. Carolina Clear addresses the special significance of South Carolina's water resources and the role they play in the state's economy, environmental health, and overall quality of life.

Thank you to all of our partners!

www.clemson.edu/carolinaclear

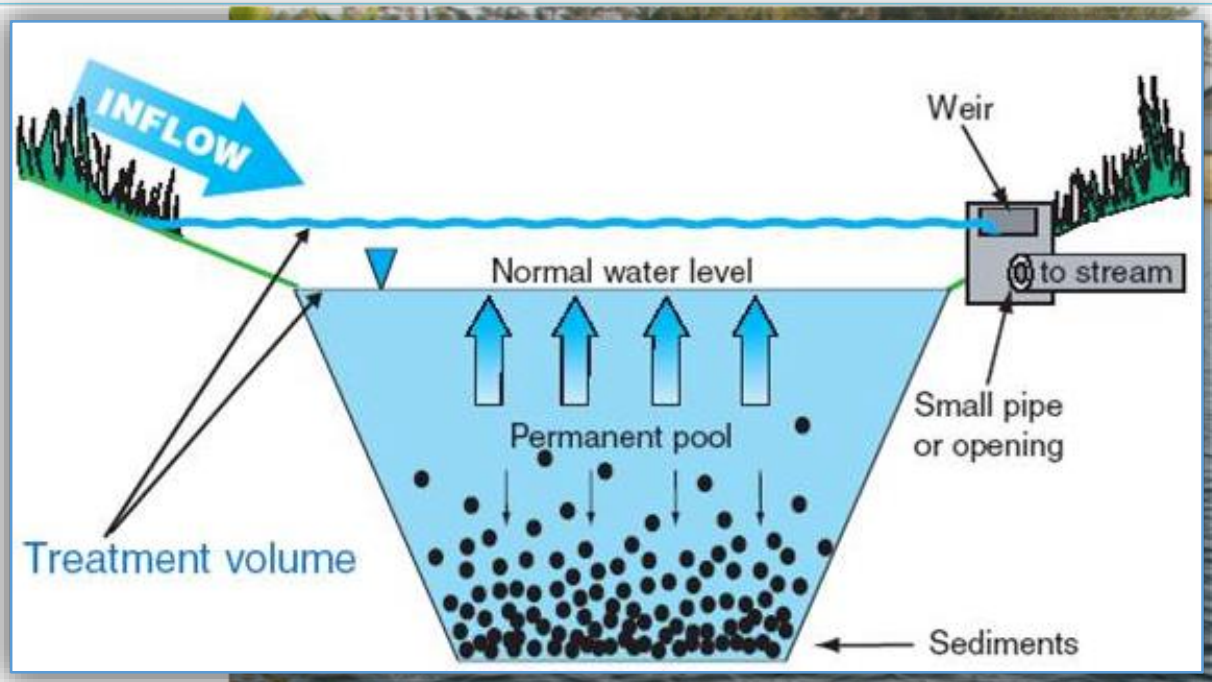
843-730-5067

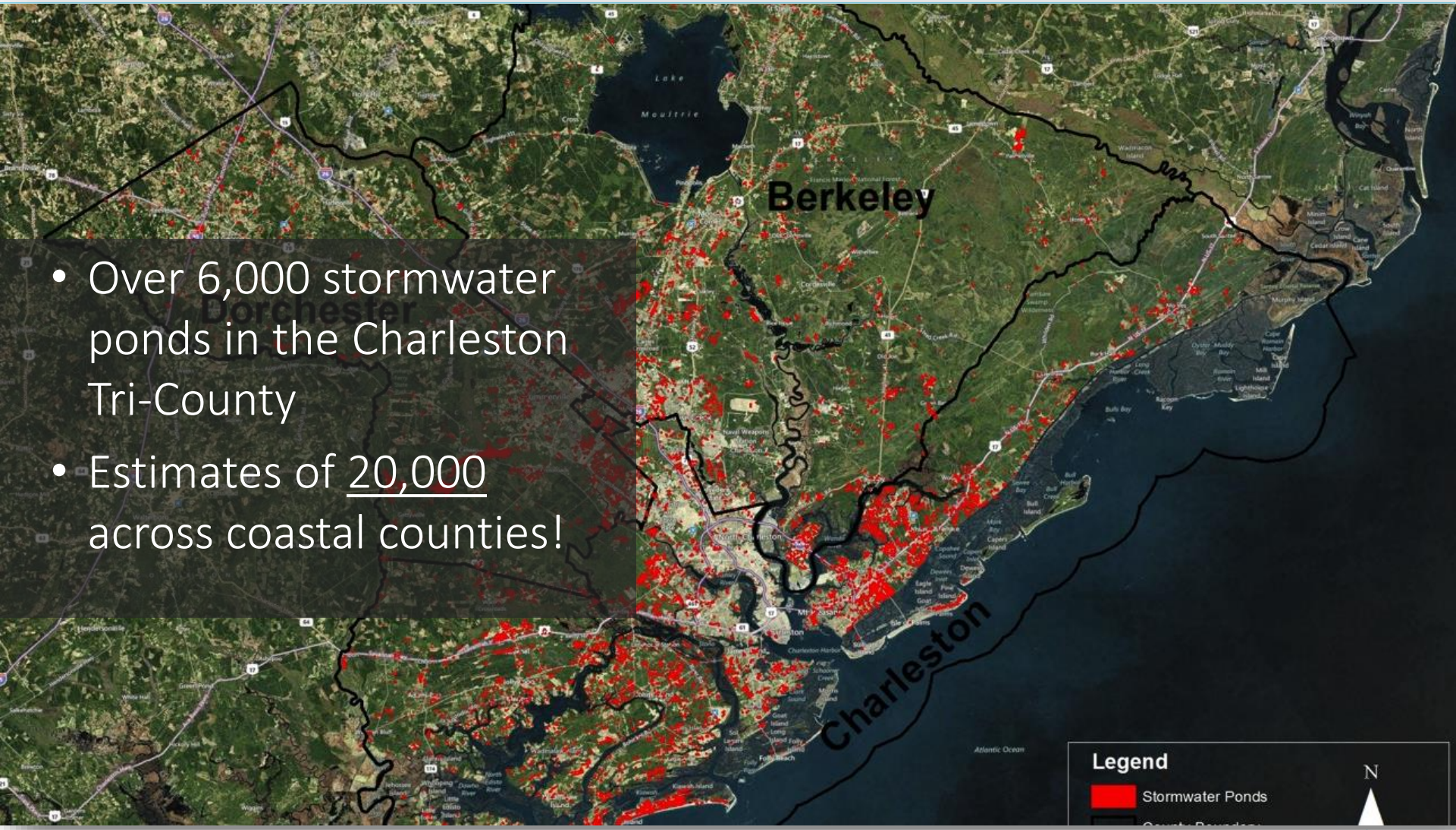







“PONDS: KEEPING OUR FLOODS AT BAY AND POLLUTION AWAY!”





- Over 6,000 stormwater ponds in the Charleston Tri-County
- Estimates of 20,000 across coastal counties!

NO MAINTENANCE?

- Impaired pond function may result in flooding on <u>your</u> property.

WHAT ABOUT DOWNSTREAM?

Mismanagement or poor management impacts our access to **clean water** and potentially, our **health**.

SEARCH: "CLEMSON STORMWATER POND"

Programs | Services | Resources | County Offices | About Us

CU › Cooperative Extension › FNR › Water › Stormwater Ponds › Home

Managing Stormwater Ponds

This site assists homeowners associations (HOAs), community managers, property management compani
the best management options for maintaining their stormwater ponds. This site includes a diagnostic tool
and preventing common problems that develop as stormwater ponds age. These include aquatic weeds, fish kills, shoreline erosion, poo
quality, nuisance wildlife, and much more. Stay tuned to this website as resources, helpful information and events continue to be posted!

Stormwater Pond Problem Solving

Resources for Pond Managers

Upcoming Events

Neighborhood Stormwater Pond Maintenance Log and Resources

Compiled by Sarah Rollins
Original Content Provided by Ben Powell

Photos: University of Florida, PixiePie

Stormwater Pond Identification Sheet

Pond ID: _____
(ex. P-01, P-02, etc)

Location: _____
(ex. Intersection of x and y, or at neighborhood entrance, etc...)

Dimensions:
Acreage: _____
Surface Area: _____
Design Volume: _____

Date of Construction: _____

Aeration Device:
Brand/Make/Model number: _____

Access points/Maintenance Rights of Way:
_____
_____
_____
_____

Permitted activities in pond: *ex. swimming, fishing...* _____
_____
_____

Prohibited activities in pond: *ex. swimming, fishing...* _____
_____

Receiving waterbody: (names of waterways receiving pond overflow)
_____
_____
_____

Roughly sketch your pond and label the locations of the inflow and outflow structures and maintenance rights of way with latitude and longitude coordinates:

# of Inflow Structures: _____
# of Outflow Structures: _____

www.clemson.edu/carolinaclear

www.clemson.edu/extension/stormwaterponds

Stormwater Pond Semi-Annual Inspection Checklist*

Inspector: _____ Date: _____ Pond Number: _____

Inspection Items:	Checked?	Maintenance Needed?	Comments
	Y/N/NA	Y/N	
Vegetation (§ 4.0)			
1. Are the boundaries of the buffer being observed? *(no mowing to the edge, grass ≥ 6" tall)*			
2. Is your shoreline vegetation dominated by one or a few species?			
3. Is your surface water vegetation dominated by one or a few species?			
4. Is your underwater vegetation dominated by one or a few species?			
5. Is there an excessive amount of algae? *(less than 20% surface coverage is ideal)*			
Wildlife (§ 6.0)			
1. Are there signs of nuisance wildlife? *(Geese droppings, beaver dams, burrows, otter slides)*			
2. Are there areas of stagnant water that provide a breeding ground for mosquitoes?			
Water Quality (§ 7.0)			
1. Is there trash/debris in nearby storm drains?			
2. Is there trash/debris in the pond or on the shore?			
3. Does your shoreline show signs of erosion? *(undercutting, scouring, or slumping)*			
4. Are there signs of sedimentation in the pond? *(sediment accumulation in pond, decreased available pond volume)*			
Pond Structures (§ 1.0)			
1. Are there obstructions at inlets and outlets? *(trash, plant debris, construction materials)*			
2. Do inlet or outlet structures show signs of wear? *(cracked, corroded, or broken pipes)*			
Fountains and Aeration (§ 11.0)			
1. Is the aeration system functioning properly? *(water is circulating, diffuser is bubbling)*			
2. Have any fish kills been reported? *(stratification)*			
Access and Safety			
1. Is maintenance access to the pond and aeration system free of obstructions? *(no trees, no inaccessible fences or gates)*			
2. Are fences, gates, and locks in need of repair? *(broken or unlocked locks, gates, or fences)*			
3. Are there signs of vandalism/graffiti on or around pond structures?			

*Note: This checklist is presented to provide an example. Stormwater pond inspections may need to be performed more frequently and include other inspection items based on the unique conditions present at your pond. It is also good practice to inspect your pond after major storm events.

Stormwater Pond Maintenance Log

Use this sheet to track maintenance concerns and any corrective actions taken.

Pond ID: _____ **Date:** _____
(Refer to Pond Identification Sheet)

Maintenance Concern:

- ☐ Algae
- ☐ Shoreline Erosion
- ☐ Water Quality
- ☐ Sedimentation
- ☐ Nuisance Wildlife (specify): _____
- ☐ Low or High Water Levels
- ☐ Muddy Water
- ☐ Surface Films and Slimes
- ☐ Fish Kills
- ☐ Other (specify): _____

Event Description: *(What caused you to call for service? Include season, temperature, and other details of when problem originated.)*

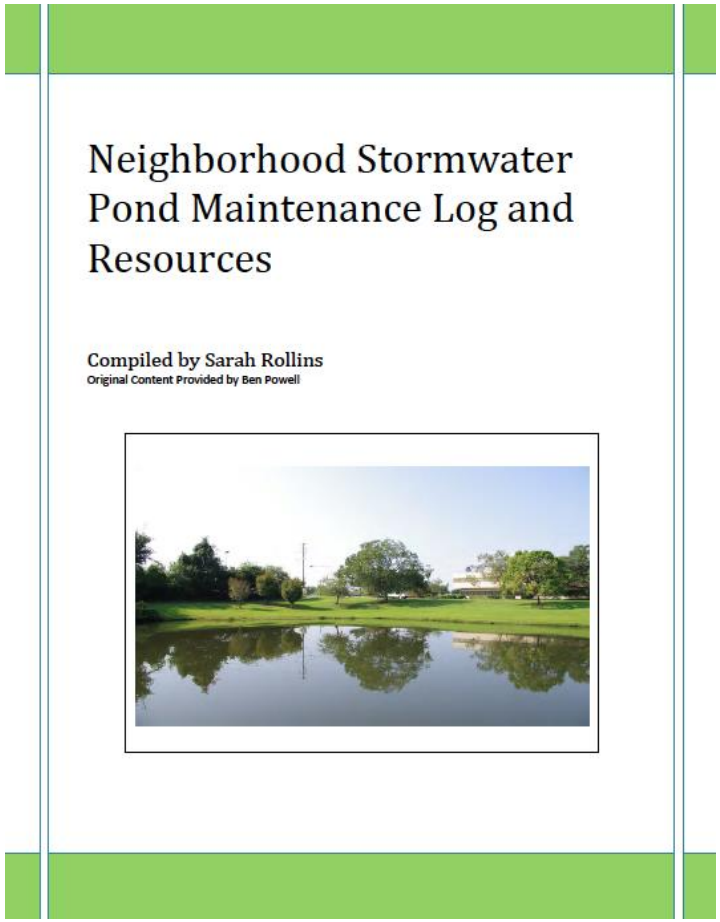
Remediation/Maintenance Activity Performed and by Whom:

Cost of Remediation/Maintenance:

Follow Up Services or Recommendations: *(Include name of board member/resident responsible for follow-up)*

www.clemson.edu/carolinaclear www.clemson.edu/extension/stormwaterponds

FREE BINDER?

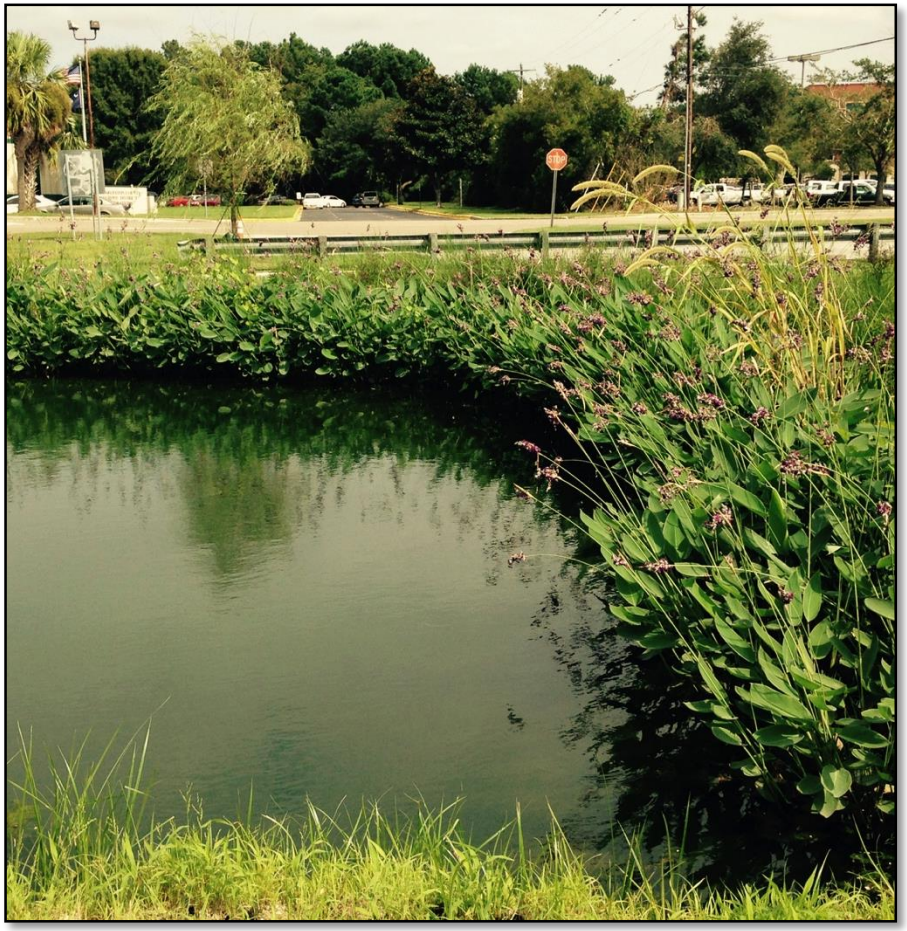


- HOAs: Take a binder and participate in our binder evaluation!

TRAININGS

- Designed for pond owners and managers
- Teaches principals of integrated pond management
- Abbreviated or commercial-recognition options

BEFORE AND AFTER!



www.clemson.edu/cyn

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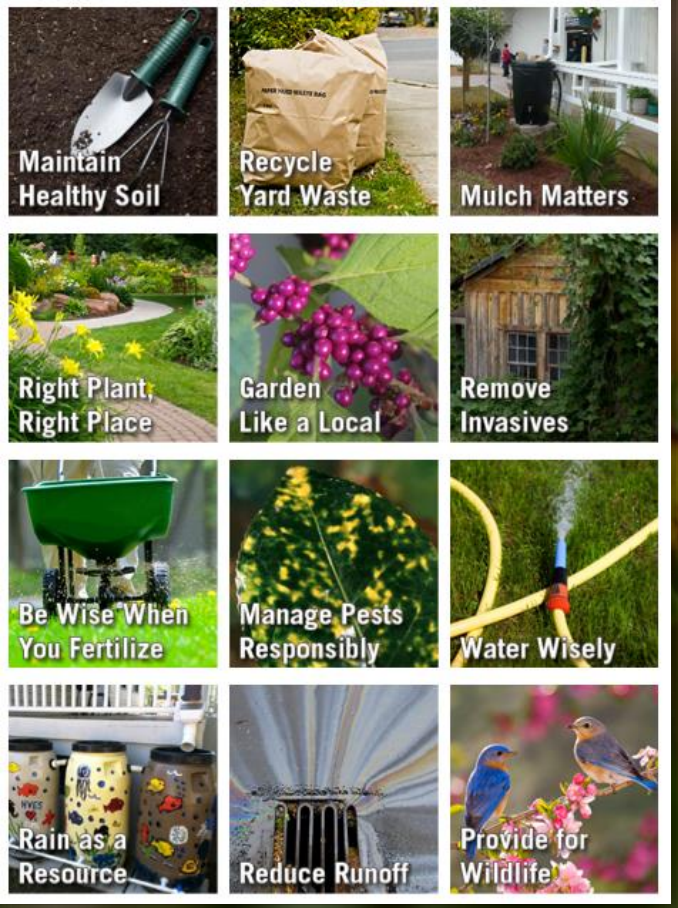
Carolina YARDS
A CLEMSON EXTENSION SERVICE

Carolina Yard Actions



REDUCE YOUR RUNOFF FOOTPRINT

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SOAK IT IN!

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Carolina Yards Plant Database

Welcome to the Carolina Yards Plant Database which contains nearly 300 plants that are suited to growing in South Carolina. Plants were selected with the principles of environmental landscape design in mind. Remember, good landscape design hinges on choosing the right plant for the right place.

Use the search options below to make an informed decision when selecting plants. All search fields are optional; you may choose one or more search criteria. If you receive insufficient results, try searching on fewer fields. Click here to determine which planting region your county is in, and watch for more search tips coming soon!

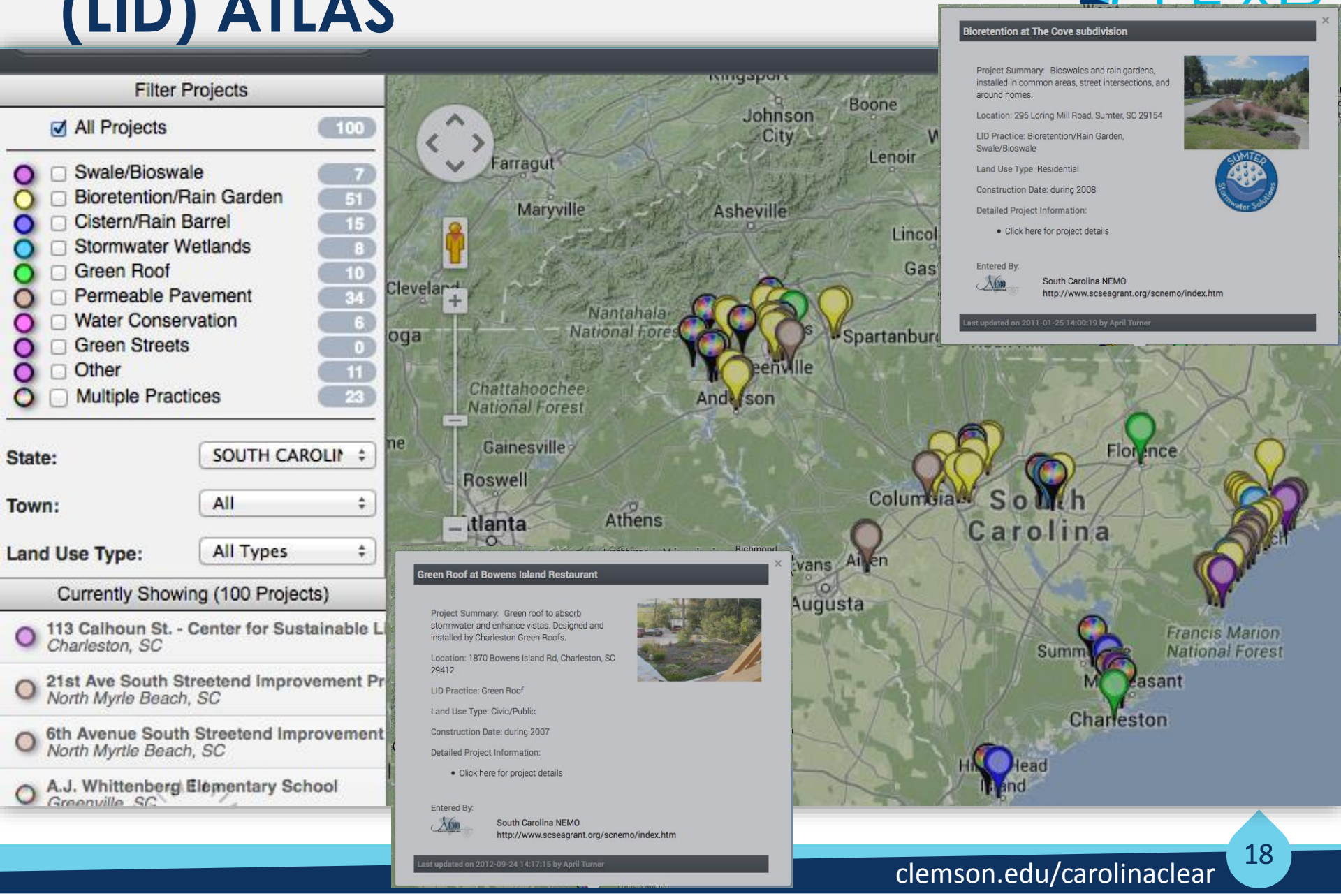
Home | Name Search | Browse by Region | Browse by Type | Browse by Photo

Search the Plant Database

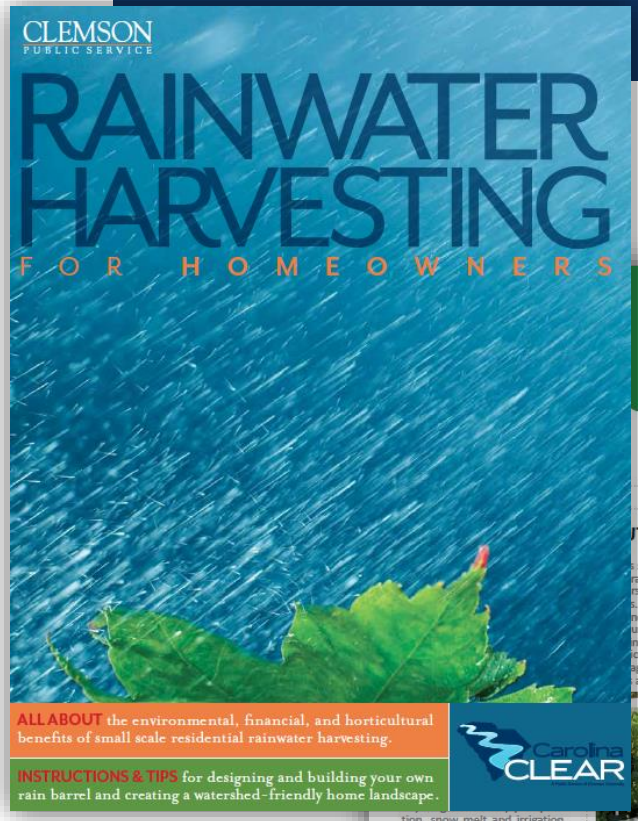
REGION	Select	*Which part of South Carolina are you in?*
SC NATIVE	Select	*Are you looking for a plant native to South Carolina?*
PLANT TYPE	Select	*What kind of plant are you looking for?*
SUNLIGHT	Select	*How much sunlight shines in your yard?*
SOIL TYPE	Select	*What kind of soil do you have in your yard?*
SOIL pH	Select	*What is the pH of your soil?*
SOIL MOISTURE	Select	*How wet is the soil in your yard?*
SALT TOLERANCE	Select	*Do you require a salt-tolerant plant?*
WILDLIFE	Select	*What animals would you like to attract or deter?*
STORMWATER	Select	*Will this plant be used in a stormwater management practice?*

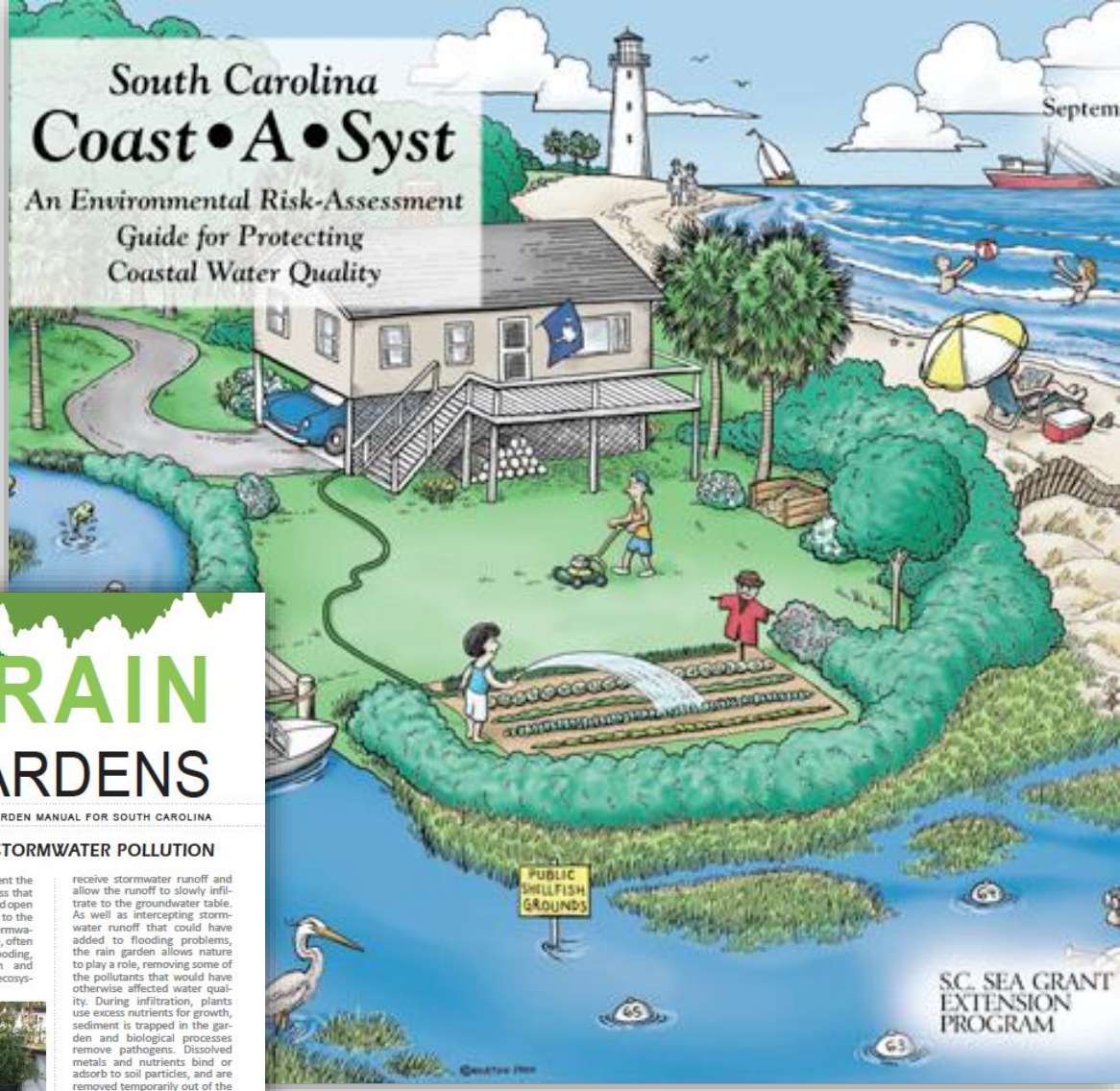
Search

SC LOW IMPACT DEVELOPMENT (LID) ATLAS



FREE DOWNLOADS!





FREE downloads!

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SC WaterWays

- Shorescaping – Freshwater and saltwater!
- Floating Wetlands
- Introduction to Rain Gardens and Plant Selection
- Permeable Pavement
- Canada Geese Control
- Water-wise gardening
- Native plant use
- Cyanobacteria
- Aquatic Plant Control

H2O-020

SC WaterWays

answering today's water resource challenges for future generations

Cyanobacteria: Understanding Blue-Green Algae's Impact on Our Shared Waterways

Guinn Garrett Wallover, Water Resources Agent, Clemson Extension — August 2015

In August 2014, news outlets across the country reverberated with the shocking story that a large harmful algal bloom in Lake Erie had produced a dangerous toxin (microcystin) that threatened the drinking water supply for over 500,000 people in the Toledo, Ohio area (Zimmer, 2014). The occurrence of this type of algal bloom, called cyanobacteria or blue-green algae, is not an isolated event. Cyanobacteria have impacted much of our South Carolina surface waters and some water systems as well. With the frequency of these harmful algal blooms increasing across the nation, South Carolina residents can take action to prevent harmful algal blooms and protect our shared waterways.

What are cyanobacteria/blue-green algae?

Cyanobacteria, sometimes referred to as blue-green algae, share characteristics with both algae and bacteria. Cyanobacteria are closely related to true bacteria, but perform photosynthesis like algae to gain or fix energy, and in turn, produce oxygen. Cyanobacteria are among the oldest organisms on earth and occur in diverse habitats, including both soil and water. In water, cyanobacteria are naturally present in small numbers in slow-moving fresh or brackish water bodies. However, when waterways become enriched with nutrients, naturally or due to human-related activities, this is called **eutrophication**. This increased concentration of nitrates and phosphates can lead to rapid and explosive growth of ***cyanobacteria***. This rapid growth is called a bloom. Cyanobacteria blooms will typically occur on the surface of a waterbody and vary in color, often looking bright green to blue-green, and may be dense enough to resemble paint on the water's surface (see *Figure 1*).

Figure 1. Cyanobacteria blooms often have a cellular bright bluish or green coloration, giving them the name "blue-green algae". Dense blooms may resemble what looks like paint on the water's surface, as seen in the photo on the right. Photos courtesy Hillary Repik.

All algal blooms have the potential to negatively affect the health of a waterway through the depletion of available oxygen in water for aquatic and marine life. Low dissolved oxygen levels can lead to fish kills; when this condition persists, the result is "dead zones," where oxygen in water is so low that aquatic life is suffocated and very little life exists.

An informational series from Clemson University's Water Resources Program Team

- Landscape, garden, indoor plants
- Food safety, nutrition, health
- Insects, diseases
- And, more!

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http://www.clemson.edu/extension/hgic

HGIC 1729 1-888-656-9988

HOME & GARDEN INFORMATION CENTER

Rainwater Harvesting Systems Guidance for Schoolyard Applications

Rainwater harvesting is the collection and storage of rainwater from roof surfaces for use in both potable and non-potable applications, and for stormwater, erosion and flood control. Rainwater harvesting is an ancient practice and is still widely used throughout the world, becoming more popular in residential yards and schoolyards in the United States.

For the purpose of this guidance document, the focus is on the collection and non-potable use of rainwater in schoolyard landscapes.

Why Harvest Rainwater?

Irrigation: Harvested rainwater can be used to irrigate landscape beds, butterfly gardens, rain gardens, and container plants, as well as to create wildlife features such as birdbaths or butterfly puddling areas.

Stormwater Runoff: Rainwater harvesting manages polluted runoff by decreasing the volume of stormwater that moves across the landscape, transporting pollutants, such as fertilizers, pet waste, sediment, and litter, to nearby waterways.

Flooding & Erosion issues: This practice can also be used to manage flooding and erosion around the foundation of a building.

How Much Water Can Be Collected?

As a general rule of thumb, for every one-inch of rain and every one-square foot of roof surface, the potential exists to capture over half of a gallon of water. To put this into perspective, for a one-inch rain event, a 1000 square foot roof can yield more than 600 gallons of water. Rainwater harvesting provides an excellent tool to teach students about local rainfall patterns, water conservation, impervious surfaces and watersheds, as well as the volume of water that falls on a property when it rains.

Did you know? A 1000 square foot roof area can generate 600 gallons of water during a one-inch rain event.

Use of Harvested Rainwater in the Schoolyard: Bacteria and other pollutants (such as fecal matter from a visiting squirrel or bird, or heavy metals from roofing materials) can accumulate on roof surfaces. Because harvested rainwater is collected as water flows off roof areas, these pollutants can be washed off the roof and end up in the collection tank. Due to these potential health concerns, application of harvested rainwater on edibles can only be safely done by following specific protocols; for additional information visit HGIC 1728 *Best Practices for Application of Harvested Rainwater on Edibles.*

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www.ashleycooper.org

Upcoming Events

ACSEC Rain Barrel Program Sale May 21 - Jun 1

For a limited time, the ACSEC and its partners are offering Berkeley, Charleston and Dorchester residents rain barrels at a discounted $68 price. IVY is a 50 gallon, black...

Carolina Yards Online Course May 22 12am - Jun 12

Join Clemson Extension for a five week, online course designed to help Carolina gardeners learn to grow and maintain an environmentally friendly garden! Enjoy online training...

Location: Online

2014 Charleston Area Stormwater Pond Management Conference May 22 8:30am

The 2014 Charleston Area Stormwater Pond Management Conference will provide a forum to share the latest information and resources for the Lowcountry community. The agenda...

Sediment Basin Workshop Jun 5 9am

The one-day workshop will be held from 9AM-3:30 PM on Thursday, June 5th, at the USDA Vegetable Laboratory (2700 Savannah Highway, Charleston SC 29414). The Sediment Basin...

Exploring Lowcountry Waterways 4H2O Summer Camp - June Session Jun 16 8am - Jun 20

Clemson Extension 4-H2O is a water-based science camp giving students the opportunity to explore South Carolina's rich waterways, learn about water quality and the importance...

THANK YOU!

Contact:

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